UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,139	07/07/2003	George J. Miao		9021

7590 09/19/2006

George J. Miao
2 Inverness Drive
Marlboro, NJ 07746

EXAMINER	
DSOUZA, JOSEPH FRANCIS A	
ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 09/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/614,139	MIAO, GEORGE J.	
	Examiner	Art Unit	
	Adolf DSouza	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Specification

1. The disclosure is objected to because of the following informalities:

- In the Title, "outdor" should be changed to "outdoor"

- In the specification (page 1, line 11), "scare" should be changed to "scarce".

- In the specification (page 3, Equation 2), the negative sign should be changed to positive sign, since line 5 states average of the upper and lower –10 dB points.

- In the specification (page 3, line 19), "can be occurred" should be changed to "can occur"

- In the specification (page 3, line 23), "transmission of data" should be changed to "transmit data".

- In the specification (page 4, line 20), "block diagram of showing one embodiment" should be changed to "block diagram of one embodiment".

- In the specification (page 4, line 24), "block diagram of showing multichannel" should be changed to "block diagram of a multichannel"

- In the specification (page 5, line 1), "block diagram of showing multichannel" should be changed to "block diagram of a multichannel"

- In the specification (page 5, line 12), "block diagram of showing a digital" should be changed to "block diagram of a digital"

- In the specification (page 6, line 16), "forth" should be changed to "fourth".

- In the specification (page 8, line 10), "parallels" should be changed to "parallel".

- In the specification (page 11, line 24), "odd symmetric"" should be changed to "even symmetric".

- In the specification (page 13, line 2), "odd symmetric"" should be changed to "even symmetric".

- In the specification (page 13, line 8), "odd symmetric"" should be changed to "even symmetric".

- In the specification (page 14, Table 3), the entries under "Labels of the channel frequency spectrums" should be changed to 620A, ... 620K.

- In the specification (page 14, line 8), "is called as the digital" should be changed to "is called the digital".

- In the specification (page 15, line 22), "odd symmetric" should be changed to "even symmetric".

- In the specification (page 16, line 7), "meets the requirement the transmitter" should be changed to "meets the requirement of the transmitter".

- In the specification (page 16, line 9), "symmetry" should be changed to "symmetric".

- In the specification (page 16, line 10-11), "zero into in the between of every two filter" should be changed to "zero in between every two filter".

- In the specification (page 16, line 14), "Since the filter" should be changed to "The filter".

- In the specification (page 19, line 5), "There does not exist the fourth channel" should be changed to "The fourth channel does not exist".

- In the specification (page 19, line 7), "By no transmitting" should be changed to "By not transmitting".

- In the specification (page 19, line 17), "There is not the fifth" should be changed to "There is no fifth".

- In the specification (page 19, line 19), "By no transmitting" should be changed to "By not transmitting".

- In the specification (page 20, line 5), "By no transmitting" should be changed to "By not transmitting".

Appropriate correction is required.

Claim Objections

2. Claims 1, 10, 12 – 15, 17, 19 are objected to because of the following informalities:

Regarding claim 1, the acronym UWB should be written as "Ultra-Wideband (UWB)".

Regarding claim 12, the acronym WLAN should be written as "Wireless Local Area Network (WLAN)".

Regarding claim 13, "with inserting one zero into the between of two filter coefficients" should be changed to "by inserting one zero between two filter coefficients".

Regarding claims 10 and 15, "odd symmetric" should be changed to "even symmetry", since the coefficients of the filter are symmetric as shown in Table 2 (page 12) or Figure 5. It is known to one of ordinary skill in the art that "even symmetric" filters are those where the coefficients are symmetric. The attached reference (College of engineering, University of California, Riverside) discloses this (page 2, paragraph (a); page 4 paragraph (a)).

Regarding claims 12 and 19, "transmitter may transmit" should be changed to "transmitter may not transmit" since the selected channel is not transmitted to avoid interference.

Regarding claim 14, "comprising" should be changed to "comprises".

Regarding claim 17, "low pass filter has 4 filter taps" should be changed to "low pass filter has 10 filter taps". This is shown in Fig. 12 and page 17, Table 5.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1 – 3, 6 – 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264).

Regarding claim 1, Crochiere discloses a multichannel filter (page 292, Fig, 7.3; page 299, Fig. 7.8, element "Synthesizer"; page 290, section 7.1 – page 300, end of section 7.2.1) comprising:

a digital FIR lowpass-shaping filter (Fig. 7.8, filter f(n) in each channel path);

OR a digital cascaded FIR filter including a digital multiband FIR lowpass-shaping filter and a digital FIR rejected lowpass filter generating an output ripple signal magnitude about 61.8 (dBm) less than the normalized gain at a frequency of 0.325 GHz.

Crochiere does not disclose that a UWB communication transceiver.

In the same field of endeavor, however, Tewfik discloses a UWB communication transceiver (section II which describes the transmitter side, up to section A; section 1V – receiver side).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Tewfik, in the system of Crochiere because this would allow the multichannels synthesized by the low pass filter to be transmitted in the UWB range, as disclosed by Tewfik (page 2261, Equations 1 and 2).

Regarding claim 2, Crochiere discloses the digital FIR lowpass-shaping filter is only one single filter that may be reused to generate all of the multichannel signal with different multi-carrier frequencies (page 299, Fig. 7.8, filter f(n); page 297, section 7.2.1; wherein the one filter is the filter f(n) that is used to generate all channels).

Regarding claim 3, Crochiere discloses the digital cascaded FIR filter is only one single filter that may be reused to generate all of the multichannel signal with different multi-carrier frequencies (page 299, Fig. 7.8, filter f(n); page 297, section 7.2.1; page 258, section 6.1.2; wherein the single filter that is used to generate all channels is the filter f(n) and the two stage cascaded implementation of the filter is as described in section 6.1.2).

Regarding claim 6, Crochiere discloses the outdoor handheld UWB transceiver may select either said digital FIR lowpass shaping filter or said digital cascaded FIR filter to produce the multichannel UWB signal with scalability data rates (page 258, section 6.1.2; Fig. 6.4; wherein the filter used is either the single stage low pass filter or the two stage cascade implementation).

Regarding claim 7, Crochiere discloses the digital FIR lowpass-shaping filter and said digital cascaded FIR filter is equivalently produce the same transmitter function to meet the outdoor transmitter spectrum mask (page 259, Fig. 6.4; page 260, paragraph starting with "By way of example ...", last 6 lines; wherein the spectra are the same since the stop band ripple mask is met by both the single and cascaded filters).

5. Claims 4 - 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264) and further in view of Van Nee (US 6,175,550).

Regarding claims 4 and 5, Crochiere discloses the digital FIR low pass filter and cascaded filter to produce a multichannel spectrum (page 297, section 7.2.1; page 258, section 6.1.2).

Crochiere does not disclose that the data rate can be changed by shutting off some of the channels.

In the same field of endeavor, however, Van Nee discloses produce the scalability data rates with multi-carrier frequencies (column 3, lines 21 – 27; column 11, lines 23 - 28).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Van Nee, in the system of Crochiere because this would allow the data rate to be varied, as disclosed by Van Nee.

6. Claim 8 - 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264) and further in view of McClellan (A Unified Approach to the Design of Optimum FIR Linear Phase Digital Filters; Nov. 1973; IEEE Transactions on Circuit Theory; pages 697 – 701).

Regarding claim 8, Crochiere discloses a digital FIR lowpass-shaping filter (page 258, section 6.1.2).

Crochiere does not disclose UWB transmitter and a filter with multiple transition bands.

In the same field of endeavor, however, Tewfik discloses a UWB transmitter (section II which describes the transmitter side, up to section A).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Tewfik, in the system of Crochiere because this would allow the multichannels synthesized by the low pass filter to be transmitted in the UWB range, as disclosed by Tewfik (page 2261, Equations 1 and 2).

In the same field of endeavor, however, McClellan discloses a lowpass band 0 - 0.26 (GHz); a first transition band 0.26 - 0.325 (GHz) ; a second transition band 0.325 - 0.39 (GHz) ; a third transition band 0.39 - 0.45 (GHz) ; and a stop band 0.45 - 0.5 (GHz) (page 697; section I, 1st paragraph and last 3 lines; wherein the mask is interpreted as being one of the arbitrary filter specifications that can be designed using the Remez algorithm for FIR filter design, with the frequencies of the passband, transition band and stop band being a choice of the designer. One of ordinary skill in the art can easily choose the breakpoints in the frequencies and then use Remez algorithm to generate the filter coefficients.).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by McClellan, in the system of Crochiere because this would allow any mask to be designed and filter coefficients generated using Remez algorithm.

Regarding claim 9, Crochiere disclose that the digital FIR lowpass-shaping filter is only one filter that may be needed in the use for the entire multichannel (Fig. 7.8, filter f(n) that is used for each channel; page 297, section 7.2.1).

Applicant has disclosed in the specification (Fig. 5; page 12, Table 2) that the 83 tap filter is an even filter with linear phase and not an odd filter (see Claim Objections for claim 10). Therefore, Examiner has interpreted the FIR filter as being an even filter.

Regarding claim 10, Crochiere discloses that the digital FIR lowpass-shaping filter may have 83-filter taps with even symmetry and linear phase (page 259, Fig 6.4 (a); wherein the number of taps of the filter is interpreted as a design choice to give the desired frequency response).

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264) and further in view of McClellan (A Unified Approach to the Design of Optimum FIR Linear Phase Digital Filters; Nov. 1973; IEEE Transactions on Circuit Theory; pages 697 – 701) and Van Nee (US 6,175,550).

Regarding claim 11, Crochiere discloses the digital FIR low pass filter (page 297, section 7.2.1; page 258, section 6.1.2).

Crochiere does not disclose that the data rate can be changed by shutting off some of the channels.

In the same field of endeavor, however, Van Nee discloses produce the scalability data rates with multi-carrier frequencies (column 3, lines 21 – 27; column 11, lines 23 - 28).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Van Nee, in the system of Crochiere because this would allow the data rate to be varied, as disclosed by Van Nee.

8. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264) and further in view of McClellan (A Unified Approach to the Design of Optimum FIR Linear Phase Digital Filters; Nov. 1973; IEEE Transactions on Circuit Theory; pages 697 – 701), Van Nee (US 6,175,550) and Agee (US 6,128,276).

Regarding claim 12, Crochiere discloses the digital FIR low pass filter (page 297, section 7.2.1; page 258, section 6.1.2).

Crochiere does not disclose shutting off a channel to prevent interference.

In the same field of endeavor, however, Agee discloses may not transmit the UWB data onto the selected channel to avoid the interference with WLAN 802.11a (column 2, lines 25 – 29; wherein the WLAN interference is interpreted as the interference that a channel sees).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Agee, in the system of Crochiere because this would allow the receiver's to work properly when interference on the same channel is present, as disclosed by Agee.

9. Claims 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264) and further in view of Gerereux (US 5,272,656).

Regarding claim 13, Crochiere discloses a cascaded digital FIR low pass filter and a digital rejected FIR lowpass filter (page 258, section 6.1.2; Fig. 6.5; wherein the digital rejected FIR filter is the filter $h_2(n)$).

Crochiere does not disclose a UWB transmitter and inserting a zero in between the filter coefficients.

In the same field of endeavor, however, Tewfik discloses a UWB transmitter (section II which describes the transmitter side, up to section A).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Tewfik, in the system of Crochiere because this would allow the multichannels synthesized by the low pass filter

to be transmitted in the UWB range, as disclosed by Tewfik (page 2261, Equations 1 and 2).

In the same field of endeavor, however, Genereux discloses a digital multiband FIR lowpass-shaping filter that is generated by a digital enlarged FIR lowpass shaping filter with inserting one zero into the between of two filter coefficients (column 8, lines 38 – 50; wherein inserting a zero is accomplished with L = 2).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Genereux, in the system of Crochiere because this would allow generation of an interpolated filter with an identical frequency response in the lower ½ of the band, as disclosed by Genereux.

10. Claims 14 – 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264) and further in view of Gerereux (US 5,272,656) and McClellan (A Unified Approach to the Design of Optimum FIR Linear Phase Digital Filters; Nov. 1973; IEEE Transactions on Circuit Theory; pages 697 – 701).

Regarding claim 14 and 16, Crochiere discloses a digital enlarged and rejected FIR lowpass-shaping filter (page 258, section 6.1.2; page 259, Fig. 6.5).

Crochiere does not disclose a filter with multiple transition bands.

In the same field of endeavor, however, McClellan discloses a lowpass band 0 - 0.512 (GHz); a first transition band 0.512 - 0.65 (GHz); a second transition band 0.65 - 0.78 (GHz); a third transition band 0.78 - 0.9 (GHz); and a stop band 0.9 - 1.0 (GHz) and a lowpass band 0 - 0.28 (GHz); a transition band 0.28 - 0.7 (GHz); and a stop band 0.7 - 1.0 (GHz). (page 697; section I, 1st paragraph and last 3 lines; wherein the mask is interpreted as being one of the arbitrary filter specifications that can be designed using the Remez algorithm for FIR filter design, with the frequencies of the passband, transition band and stop band being a choice of the designer. One of ordinary skill in the art can easily choose the breakpoints in the frequencies and then use Remez algorithm to generate the filter coefficients.).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by McClellan, in the system of Crochiere because this would allow any mask to be designed and filter coefficients generated using Remez algorithm.

Applicant has disclosed in the specification (Fig. 9, 12; page 16, Table 4; page 17, Table 5) that the 51 and 10 tap filters are even filter with linear phase and not an odd filter (see Claim Objections for claim 15). Therefore, Examiner has interpreted the FIR filter as being an even filter.

Regarding claims 15 and 17, Crochiere discloses that the digital FIR lowpass-shaping filter may have 51 or 10 filter taps with even symmetry and linear phase (page 259, Fig

6.4 (c); wherein the number of taps of the filter is interpreted as a design choice to give the desired frequency response).

11. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264) and further in view of Gerereux (US 5,272,656) and Van Nee (US 6,175,550).

Regarding claim 18, Crochiere discloses the cascaded digital FIR low pass filter (page 258, section 6.1.2; Fig. 6.5).

Crochiere does not disclose that the data rate can be changed by shutting off some of the channels.

In the same field of endeavor, however, Van Nee discloses produce the scalability data rates with multi-carrier frequencies (column 3, lines 21 – 27; column 11, lines 23 - 28).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Van Nee, in the system of Crochiere because this would allow the data rate to be varied, as disclosed by Van Nee.

12. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crochiere et al. (Multirate Digital Signal Processing; 1983; Prentice-Hall) in view of Tewfik (High Bit Rate Ultra-Wideband OFDM; Nov. 17 - 21, 2002; IEEE Globecom 2002; pages 2260 – 2264) and further in view of Gerereux (US 5,272,656) and Van Nee (US 6,175,550) and Agee (US 6,128,276).

Regarding claim 18, Crochiere discloses the cascaded digital FIR low pass filter (page 258, section 6.1.2; Fig. 6.5).

Crochiere does not disclose shutting off a channel to prevent interference.

In the same field of endeavor, however, Agee discloses may not transmit the UWB data onto the selected channel to avoid the interference with WLAN 802.11a (column 2, lines 25 – 29; wherein the WLAN interference is interpreted as the interference that a channel sees).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Agee, in the system of Crochiere because this would allow the receiver's to work properly when interference on the same channel is present, as disclosed by Agee.

Other Prior Art Cited

The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure.

The following patents are cited to further show the state of the art with respect to multichannel systems and multistage filters:

Libove et al. (US 6433720) discloses use pulse generator for UWB systems.

Miller et al. (US 20030067963) discloses a mode controller for signal acquisition and tracking in an ultra wideband communication system.

McCorkle et al. (US 6505032) discloses carrier less ultra wideband wireless signals for conveying application data.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adolf DSouza whose telephone number is 571-272-1043. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Adolf DSouza
Examiner
Art Unit 2611

AD

MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER